



*Curtis Bollington looks at design and comfort*

In the Hunchback of Notre Dame's day there wasn't the choice of micros around that you have now. That's probably why he ended up hanging perilously from the gargoyles of the great Paris cathedral, wild-eyed, shabby clothes hiding his contorted frame, his mouth twisted into a set snarl and his hair matted. Whatever machine he had *definitely* didn't suit him.

You've probably come across micro users who are in more or less the same state. But, with many popular home micros on the market, you should be able to choose one which will suit your needs.

*PC Games* has been taking a critical look at various aspects of these popular home machines. To date we have appraised the Basic language and the sound capabilities of each micro. This month we compare their designs, documentation and ease of use.

The **Spectrum** is a computer from the Sinclair stable. It has the luxury of colour and a set of flashy rubber keys. The clever people at Sinclair must have decided that the keyboard of the ZX81 wasn't good enough to be repeated on the Spectrum. The rubber keypads are marginally better, but still nowhere near good enough for typing.

Single key entry is used with as many as five functions per key. There is a strip connector on the back of the machine for peripherals such as the printer. The TV, MIC and EAR sockets are also situated on the back of the machine.

The Spectrum measures 9 by 5.6 by 1.25 inches. The casing is substantial, being made of quality plastic. The manual supplied covers setting up the machine and the Basic tutorial. The Spectrum has forty keys. There are better quality keyboards available for the Spectrum but these will set you back around \$120.00, half the cost of the 16k machines. As it stands the keyboard won't allow you to use the Spectrum for word processing.



# *It's tough*





The VIC 20 is the cheapest micro to have a proper QWERTY keyboard. Don't worry about the term QWERTY, it simply describes the way in which a typewriter keyboard is arranged: the first six letters on the top line of characters are QWERTY.

But if you were to choose the VIC 20 to use for word processing you would be making a mistake. Although a proper keyboard is fitted there are no lower case characters — only capitals. There are 66 keys in all, including a full width space bar.

The VIC 20 is much larger than the 'pancake' design of the Sinclair machines. It stands about 2.75 inches from the surface on which it sits. This poses something of a problem if you have to use the keyboard for any length of time. There isn't enough of an area in front of the space bar for resting your wrists on while you type. Your hands have to hang over the keyboard and could become tired after a while.

There is a warning light on top of the machine to let you know whether the machine is on or off, very useful. Power is supplied from a separate transformer, a fairly hefty device which plugs via a lead into a DIN socket in the side of the VIC.

The panel which contains this socket holds a socket for the control port and the power switch. Everything is clearly marked so there's no danger of plugging things into the wrong place.

There are several ports located in the back of the machine. None of them are labelled. Referring to the manual will tell you the following. The gaping hole is for memory expansion. The DIN socket is for connecting a disk drive. The strip connector to the right of this is for the cassette and the final strip connector is a user port for a modem and other such devices.

The VIC 20 has its own cassette recorder which runs at a slightly different speed, so you cannot use any old tape recorder with it. Commodore chose this system so that you have to buy their cassette machine, which is a nuisance because it costs \$49.95; a cheap machine can be used with most other home computers.

The manual supplied with the VIC 20 is designed to be easy to use. It isn't. It's confusing, messy and very off-putting.

The Commodore 64 is the VIC 20's big brother. It looks very similar apart from the colour. (The CBM 64 is a sort of mushroom yeuk colour, the VIC is cream yeuk.)

The 64 has an extra joystick port on the side and there is a TV connector socket which allows the use of a standard cable so there's no need for an adaptor. There is also a channel selector, which is used to select which TV channel you want the computer screen displayed on.

The manual which is supplied with the

at the top



CBM 64 is a considerable improvement on the VIC's and it goes on to discuss Basic. This starts with 'editing' which could be confusing to an absolute beginner. It seems that if you really do want to get into Basic on the 64 you would be better buying one of the many introductory books on the market.

The **Sharp MZ-700** is another machine with a cheap look about it. There are five function keys above the main block of keys, four cursor keys to the right and the Delete and Clear keys safely out of the way in the top right-hand corner.

This machine is unusual in that it has a built-in cassette recorder and printer-plotter. The cassette recorder has a counter, which is always useful to help you find out where you are in a program and there are the usual five cassette recorder keys. To the left of this is the printer with a paper feed button, a reset light and a pen change light. The cover of this printer slides off easily to reveal the plotting mechanism: four minute ballpoint pens. The lid has a paper tear edge, which is useful because the printer only takes roll paper of a four inch width.

The back of the machine contains all the interface ports, a two pin socket for the mains lead (the transformer is built in), a reset button and a volume control. Beside the volume control are two ports which have metal plates screwed over them — one for a printer and an Input/Output bus for disk drives and other peripherals.

There are three outputs to various types of screen — TV, monitor and RGB monitor. There are two jack sockets for a cassette recorder, labelled READ and WRITE, which are the same as EAR and MIC sockets found on other micros.

The Sharp is rigidly constructed in plastic an eighth of an inch thick. It is a large machine measuring 12 by 17 by 3.5 inches.

The manual is also a large affair, and is very easy to read. Everything is explained in very simple terms. It covers what Basic is, an introduction to programming and carries on through to a fairly detailed technical manual at the back which explains all the machine's functions.

The **Spectravideo** looks superb. It has a clean cut futuristic look. It has 89 keys, including 23 on a separate calculator type keypad. The keys are proper typewriter-type keys. Unfortunately, they are stiff and spongy, and will make your fingers ache after a while.

There is a cartridge slot with a hinged door on top of the machine. It is odd that the two strip connectors on the back of the machine aren't labelled, because the joystick ports, off/on switch and power socket on the side of the machine are all labelled. Again it's a case of having to refer to the manual.

The manual is similar to the Commodore manuals — not very well laid out and confusing to wade through! You will need an alternative manual if you want to get into programming.

The ports in the back of the Spectravideo are an expansion port for peripherals, a cassette input-output port and an RF port for a lead to a TV. The RF port is a DIN socket into which is plugged a modulator.

Considering the size of the keyboard, the Spectravideo is a compact machine. The keyboard measures 14 by 4.5 inches. The entire machine measures 15.75 by 8.75 by 3.25.

The **Memotech MTX512** has a much more serious look about it than any of the other machines reviewed. It has 59 keys on the main keyboard, 12 keys on the calculator keypad and eight function keys, making a total of 79 keys in all. The keys have a firm but light feel, adding to the overall professional image.

Unlike any of the other popular home micros the Memotech has a metal case, with a black satin-like finish. All of the ports are squarely concealed in the back of the machine. There are spaces for two RS232 interfaces which aren't fitted, a monitor output, HiFi output and a DIN socket for the external power supply. A pin connector enables a parallel printer to be fitted. There is a TV socket, MIC and EAR sockets for a cassette recorder and two standard joystick ports. Concealed beneath a clip-on cover on the left hand side of the machine is a strip connector for expansion and peripherals.

The Memotech is 19 inches long by eight inches wide and a little under 2.5 inches deep. It is by far the most elegant-looking machine of the bunch.

The manual is a hefty volume which makes an attempt at being chatty but fails. It covers setting up the machine, a Basic tutorial and using a printer — but it is all difficult to wade through.

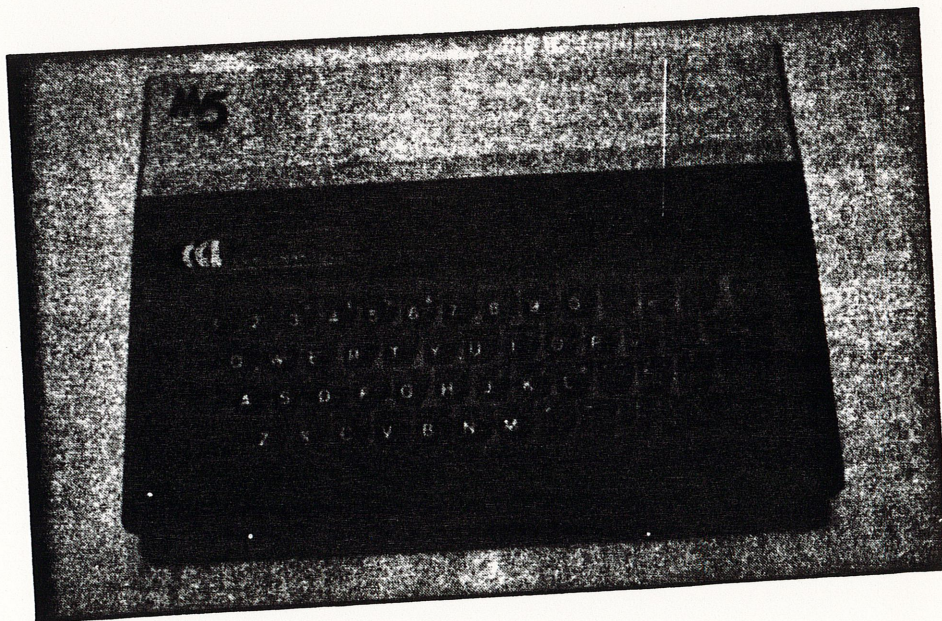
The **Tandy TRS-80** colour computer has a very practical look. There's space enough behind the keyboard on which to sit a monitor. The keyboard has a light feel, with a soft click as you press the keys down. They are set very low into the micro, which is fine except that the edge of the case hampers use of the space bar. There are 52 keys in all with no function keys or separate calculator keypad.

The Tandy has a built-in transformer and the mains lead hangs out of the back. There are two joystick DIN sockets, a serial input/output DIN socket for peripherals and a cassette DIN socket. Also on the back of the machine are a TV led socket and a reset button. The side holds a covered slot for cartridges.

Three manuals are supplied with the machine — an operation manual and two Basic manuals. One of these explains how to get started with Basic, the other is a more advanced manual for extended colour Basic. The manuals are well laid out, and, unlike those for the Memotech, are a good beginners' guide. There are indexes at the back and several program listings which illustrate features of the machine.

The **Atari XL** micros seem to be an attempt by Atari to make their micros as anonymous as possible. The old 400 and 800 definitely had more character.

The 800XL is cased in cream and brown plastic, the camouflage of suburbia, (which after all is where most micros go). There are 50 keys in all on the main keyboard which is nicely angled for ease



*The Sord MS has rubber keys, similar to those of the Spectrum*



of use. A further five keys are disguised as a metallic strip running down the right hand side next to the keyboard.

A slot which takes the Atari cartridges is situated on top of the machine. On the back there's a TV socket and a DIN socket for a monitor. A strip connector labelled 'Parallel Bus' sits in a recess next to the peripherals socket which resembles the two joystick sockets on the right hand side of the machine in shape but which is larger.

Several manuals are supplied. 'Atari Basic' is a multi-lingual guide to Basic which is of absolutely no use to the beginner. It simply explains all the commands. The other manual is a guide to setting up the machine. Alternative manuals will definitely have to be bought.

The **Sord M5** looks horrible. The case is in yeuk-cream and dirty blue plastic, reminiscent of the interior of one of those old Cortinas.

The keys are rubber pads, easier to use than those on the Spectrum, but they flop and float around in a really insipid way.

The hinged lid above the keyboard which conceals the cartridge slot falls off easily when raised — and clips back on just as easily. When raised this lid displays instructions for operation of the keys and for loading a Basic program from a cassette tape. Given that there is a cheap stand-up lid at all, the instructions at least will be a handy help for beginners.

There are several sockets on the back of the machine — DIN sockets for the external power supply, cassette player and joysticks or games paddles and then, three small phono sockets for sound, video and a TV.

The **M5** is larger than a Spectrum,

measuring 10.25 by 7.25 by 1.25 inches. The manual explains how to set up the machine and something of the functions it has, which aren't many.

The external power supply is something to behold, it measures 7.5 by 2.5 by 2.25 inches, which is a little bit over the top.

The **Electron** has 56 keys which cover letters and numbers plus a couple of extra symbols. It uses a single key entry system for Basic commands in a similar way to the Sinclair and the Sord.

The case is made of plastic with a textured finish. The **Electron** looks good mainly because the keyboard is the same colour as the case.

There is only one connector on the back of the **Electron**. This is a strip connector to which peripherals can be attached. There is no built-in power supply; the separate supply is combined with the plug. The **Electron** is very practically designed.

There are two manuals supplied with the **Electron**. One is a reference guide which covers setting up the machine, Basic and Assembler. A separate book provides an introduction to Basic which is a better guide than the other official-looking manual supplied.

The **VZ-200** is tiny. Smaller than a telephone directory (11 inches long, 6 inches from front to back, with a height of just one inch at the front of the keyboard, rising to two inches at the back), the unit is built from cream plastic. The computer is light, but does not feel excessively fragile.

The keys are rubber (much like the Spectrum keys), in light brown, with easy-to-read white legends on them. A red LED in the top right hand corner of the keyboard lets you know the machine is

on (and the on/off switch is located under the 'lip' of the keyboard, down the right hand side, in a position where it would be almost impossible to turn it off accidentally).

Each key has one or two things written on it, generally a letter (the computer works all in upper case on the screen) and a symbol (such as & or \*), or a graphics element.

This single element on the **VZ-200** shows the influence of Sinclair. The **VZ-200**, however, does not demand you use the single-touch keys. If you feel happier typing out words in full (which is almost certain to be the case if you decide to move from another computer to the **VZ-200**), this Dick Smith machine will allow you to do so. You can even mix single-touch entered words, and spell out words, in the same program line.

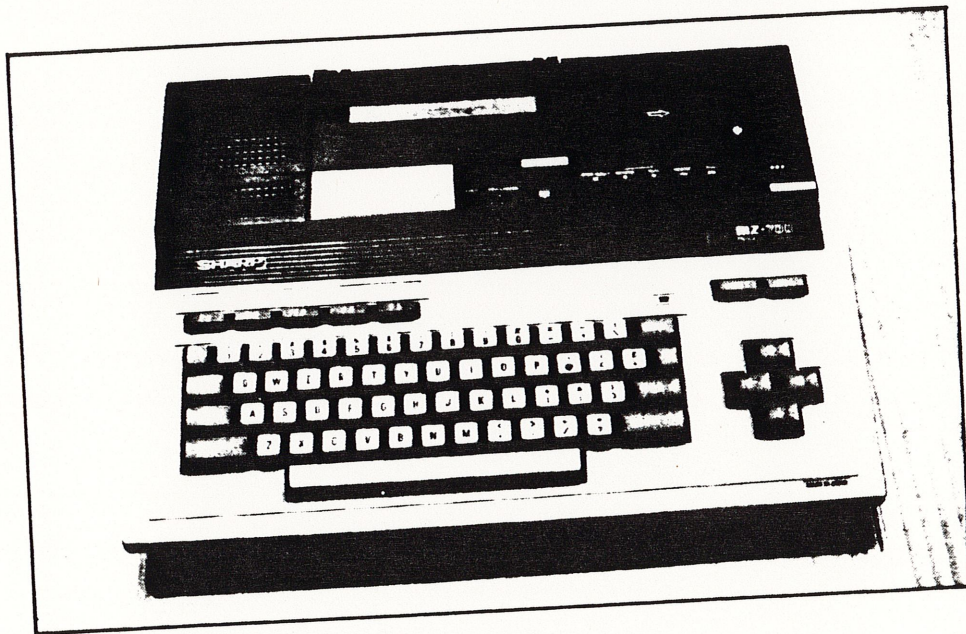
The computer comes with a separate power unit (producing 10 volts at 800 milliamps) which plugs into the rear of the machine. This is supplied with a generous three metre cable. A much shorter (around a metre) cable is provided to connect a cassette player to the **VZ-200**. A 'stereo' plug goes into the computer socket marked TAPE and the other end of the cable branches into two 3.5mm plugs, one each for the earphone and microphone sockets.

There are two video outlets. One connects your computer to a standard television, while the other is to drive a monitor, allowing a somewhat superior picture to be produced. Providing both these outlets is a good touch, allowing you to upgrade your picture quality if you have a monitor, without having to adapt the modulator output for it.

There are two sockets at the back of the machine which are protected by small panels, held in place by a couple of Phillips screws. They are marked 'memory expansion' and 'peripherals'. The 16k memory unit is rectangular, somewhat larger than a cigarette box, in the same pale cream plastic as the computer. The memory fitted easily into place, however, as with the Spectrum, I would not advise waving the computer around in the air with the extra memory in place.

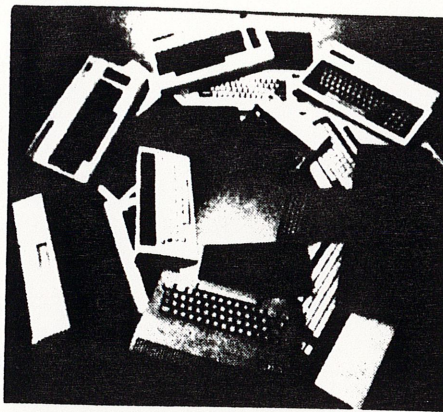
The computer comes with a hefty manual, which covers the entire **VZ-200** Basic language, touching briefly (but relatively clearly, given the complexity of the subjects) on PEEK and POKE, INP and OUT (for returning the content of a port, and for sending values to an I/O port) and to USR (to call a machine language subroutine). The manual is clear, and the intention has been to make everything as clear as possible for the first-time user.

The 'Apple compatible' **CAT** is attractively designed and solidly constructed.



*The Sharp's keyboard is an improvement on the Colour Genie*





The computer/keyboard is housed in a two-toned plastic case. Most peripheral connection sockets are on the back of the unit with the exception of two located on the right hand side. Overall, the unit has a clean and uncluttered appearance.

The standard keyboard comes with eight large function keys which allow you to enter a whole command or sequence of commands with a single keystroke. In conjunction with the SHIFT and CTRL keys, up to 24 function keys can be used. Both upper and lower case letters are available in 40 or 80 column modes. The individual keys are made of tough plastic in one of three colours: light brown, bone or orange. The keyboard is ergonomically sculpted (curved) and has a very pleasant professional feel about it.

The number of potential configurations for the CAT is quite large. The following is a list of some of the components that can be added to the main unit: RS232 adaptor, communications modem, graphic plotter, 4 colour printer plotter, joystick(s), CP/M cartridge with a 48k/64k/soft emulator, cassette recorder, multiple disk drives, 128k RAM card,

ROM cartridge and RGB/composite/green monitor and Super System Expander.

On the right hand side of the keyboard is a single socket for a twin set of joysticks. Each joystick has two buttons and a central control stick which unlike many other joysticks, does not return to the central position after being released.

The CAT comes with a 106 page User's Manual and a 203 page Basic Reference Manual, written in clear English and set out in a logical and orderly fashion. No index is provided in either manual.

The MicroBee is a very well known Australian computer. It features a real 60 key QWERTY keyboard — small but manageable.

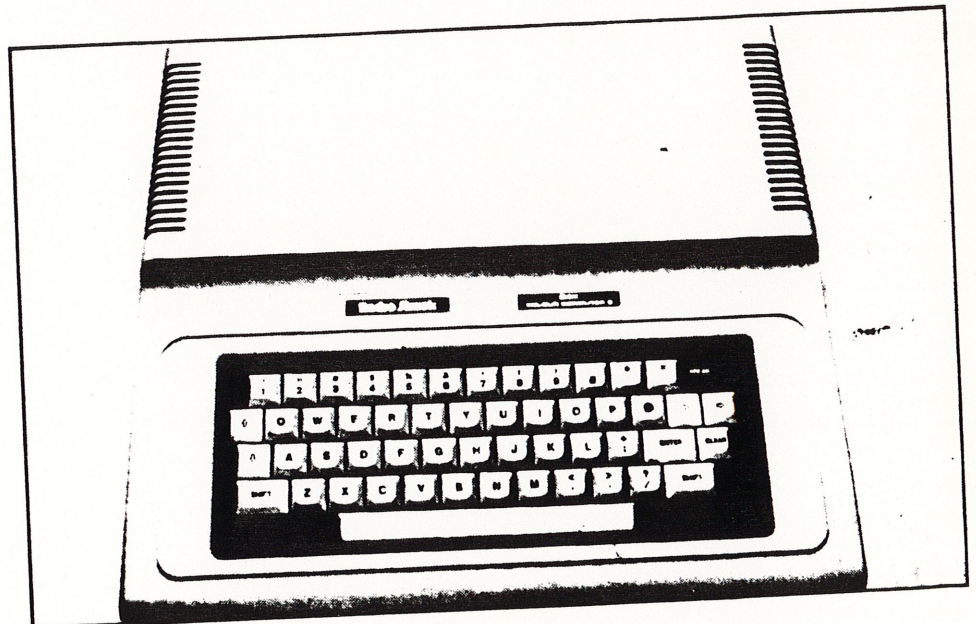
The back of the machine contains all the interface ports: power, user port, expansion interface, serial port and I/O port.

The MicroBee measures 13 inches long by 8 inches wide, 2 inches deep at the rear and a little under an inch at the front. It has a good sturdy feel about it.

The keyboard has a light feel to it with good springy keys. However, sculpted keys would help touch typists, rather than the flat surface where fingers slip off easily.

The machine will only work with a monitor (as a normal television does not have the resolution required to display the MicroBee's capability of 64 columns by 16 rows or 80 columns by 24 rows). Applied Technology, the manufacturers of MicroBee, sell monitors for \$149 or can do a package deal to convert your TV.

The Basic manual supplied covers each statement, function and command in turn. The documentation is quite adequate.



*The Tandy TRS-80 has a very practical look*

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